Remarks

1. Summary of Office Action

In the Office Action mailed June 22, 2007, the Examiner rejected claims 1-6, 8, 10, 14, and 21-26 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,282,176 (hereinafter "Hemkumar"). Further, the Examiner rejected: claims 15-20 under 35 U.S.C. § 103(a) as being obvious over a combination of Hemkumar, U.S. Patent Application Pub. No. 2004/0078104 (hereinafter "Nguyen"), and U.S. Patent No. 6,891,954 (hereinafter "Takahashi"), claim 7 under 35 U.S.C. § 103(a) as being obvious over a combination of Hemkumar and Takahashi, claims 11 and 12 under 35 U.S.C. § 103(a) as being obvious over a combination of Hemkumar and Nguyen, and claim 13 under 35 U.S.C. § 103(a) as being obvious over a combination of Hemkumar, Nnguyen, and Patent No. 6,122, 506 (hereinafter "Lau"). In addition, the Examiner objected to the drawings and specification.

2. Allowable Subject Matter

The Examiner indicated that claim 9 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

3. Amendments to the Claims

Applicants have amended claims 1, 4, 10, 15, 21, and 25 to recite the invention more particularly, as supported by Applicants' specification (*see, e.g.*, paragraphs 0020-0023, 0042-0050, and Figures 3 and 5).

Presently pending in this application are claims 1-26, of which claims 1, 4, 10, 15, 21, and 25 are independent and the remainder are dependent.

4. Response to Drawing Objections

The Examiner objected to the drawings on the basis that "as per claim 12, the information generator to produce location information, and the echo canceling devices that are coupled to the generator (and the matter in which they are coupled to the generator) must be shown or the feature(s) canceled from the claim(s)."

Applicants believe that the Examiner intended to refer to claim 13 rather than claim 12. Further, Applicants have amended claim 13 accordingly to recite: "The communication apparatus of claim 11 further including a location information generator coupled to the transceiver and operative to produce location information."

Applicants respectfully submit that the feature of location information generator (coupled to the transceiver) is illustrated in Figure 7 as an element 792, and noted in the specification in paragraphs 0066-0069.

In view of this claim amendment, Applicants respectfully request withdrawal of the drawing objections.

5. Response to the Specification Objections

The Examiner objected to the specification because of the following informalities: "It is not clear what the amplifier 584 in Fig. 7 is doing with the input signals."

Applicants respectfully submit that paragraphs 0046-0048 of the specification, as is, describe this feature. As described, a tuner circuit 586, a tape player 588 and a CD and/or DVD player 590 may provide a playback audio signal 592 to the amplifier 584. For example, a switch (not shown in Figure 7) may select a signal from either the tuner circuit 586, the tape player 588 or the CD and/or DVD player 590 for producing the

playback audio signal 592. The amplifier may then amplify this playback audio signal for playback through the speaker.

Similarly, as shown in Figure 5 and noted in the specification, the amplifier 584 may receive a separate downlink audio signal 582 from a digital to analog converter 580, and may responsively amplify the downlink audio signal to produce an amplified downlink audio signal, which may be then played through a speaker.

Thus, Applicants believe that one skilled in the art would recognize that the amplifier 584 could receive both signals 592 and 582 as inputs, and could then selectively amplify each of those input signals.

5. Response to §102 Claim Rejections

As noted above, the Examiner rejected claims 1-6, 8, 10, 14, and 21-26 as being anticipated by Hemkumar.

Under M.P.E.P. § 2131, a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. Applicants respectfully traverse the rejections of claims 1-6, 8, 10, 14, and 21-26, because Hemkumar does not disclose or suggest each and every element as recited in any of these claims.

As now amended, claim 1 for instance, recites an echo canceler circuit comprising: (i) an uplink data attenuator operative to receive at least post-echo canceler uplink data and uplink echo return loss based attenuation data and in response to attenuate the post-echo canceler uplink data to produce attenuated uplink data, and (ii) an echo return loss (ERL) based attenuation data generator operatively coupled to the uplink data attenuator and operative to produce the uplink echo return loss based attenuation

data in response to echo return loss data, *wherein the echo return loss data is* ***based on attenuated downlink data*** *and at least one of pre-echo canceler uplink data and amplifier gain data,* ***and wherein the attenuated downlink data is provided to the echo return loss based attenuation data generator before the attenuated downlink data is amplified for audio playback***. (Emphasis added). (Other independent claims (as well as their dependents) each contain similar limitations).

Applicants respectfully submit that, at a minimum, Hemkumar fails to disclose or suggest the claimed element of: an echo return loss (ERL) based attenuation data generator operatively coupled to the uplink data attenuator and operative to produce the uplink echo return loss based attenuation data in response to echo return loss data, wherein the echo return loss data is based on attenuated downlink data and at least one of pre-echo canceler uplink data and amplifier gain data, and wherein the attenuated downlink data is provided to the echo return loss based attenuation data generator before the attenuated downlink data is amplified for audio playback.

As noted above, in accordance with the presently claimed invention, the echo return loss data is based on attenuated downlink data that is provided to the echo return loss based attenuation data generator *before the attenuated downlink data is amplified for audio playback*.

To the extent relevant, Hemkumar generally relates to an echo suppressor circuit that selectively attenuates far-end and near-end signals. However, the circuit disclosed in Hemkumar is arranged in a different way from that presently claimed by Applicants and noted above.

In particular, as shown in Figure 1 and described in the corresponding text , a received downlink (or far-end) signal is first processed through a series of circuit blocks, including amplifier stages and a mute/volume controller (block 148) that precedes "an output terminal AO (Acoustic Interface Output) that connects to send a signal to a speaker". Further, in Hemkumar, the downlink data is provided to an acoustic echo canceller (via a pre-emphasis filter 150) ***after*** *the downlink data is conditioned through the mute/volume controller.* (*See* Hemkumar, col. 4, line 17, to col. 5, line 55).

In particular, in col. 5, lines 44-55, Hemkumar clearly explains that:

> "The network input signal from the receive suppressor 140 is applied to a network input half-duplex controller 142 *and conditioned using a network input mute and volume controller 148*. The conditioned network input signal is applied to an acoustic signal pre-emphasis filter 150 and to the acoustic output signal DAC 144. *The acoustic signal pre-emphasis filter 150 filters the conditioned network input signal for application to an acoustic echo canceller 152*. The acoustic output signal DAC 144 converts the conditioned network input signal to analog form and supplies the resulting analog signal to the near-end output terminal AO."

Additionally, with reference to Figure 2 illustrating the echo canceller 152 in more detail, Hemkumar further makes clear that:

> "Volume control (not shown) *is implemented in the receive path 202 only between the NEC summing node 130 and the acoustic output signal DAC 144/acoustic echo canceller 152* since a real-time external change in the gain of the speaker driver results in a change in the transfer function of the acoustic echo path and therefore forces the AEC adaptive filter to readapt. *With the volume control positioned before the adaptive filter*, the echo path does not change, and retraining is unnecessary."

Thus, in contrast to the claimed invention, in Hemkumar, the downlink signal is first amplitude-conditioned (e.g., amplified by increasing the volume of the audio signal) and *then* provided to the echo canceller 152.

As noted in Applicants' specification, such approach has drawbacks. In particular, when an echo canceller processes an amplified downlink signal, it may not be able to discriminate between a change in acoustic coupling or a change in audio system, such as a change in the gain of an audio amplifier. In effect, if the amplifier gain is increased, the echo canceller may incorrectly interpret the corresponding increase in the echo return loss as being due to an increased acoustic coupling, and the echo canceller's adaptive filter may unnecessarily attenuate the uplink signal in an effort to reduce an echo signal.

With the benefit the claimed limitation of providing ***the attenuated downlink data to the echo return loss based attenuation data generator before the attenuated downlink data is amplified for audio playback***, the claimed invention provides a way for an echo canceller circuit to more accurately detect a change in acoustic coupling or a change in an audio system, such as a change in amplifier gain (e.g., an example amplifier 584 (*see* Figure 5) that amplifies a downlink audio signal for playback).

For example, with the benefit of the claimed invention, even if the amplifier gain is increased, the echo canceler circuit may determine that since the amplitude of the downlink audio data has not changed, then the increase in echo return loss is due to increased acoustic coupling, and therefore the echo canceler may take appropriate action to reduce the transmission of undesirable loud noises at the far end. Similarly, the echo canceler circuit of the present invention may avoid unnecessarily attenuating post-echo canceler uplink data when there is no change in acoustic coupling channel, but rather the downlink data power level increases as a result of the amplifier gain change.

Because Hemkumar does not teach or suggest the invention as recited in each of claims 1-6, 8, 10, 14, and 21-26, Hemkumar fails to anticipate these claims under 35 U.S.C. § 102.

6. Response to §102 Claim Rejections of Claims 15-20

The Examiner rejected claims 15-20 on grounds of obviousness over a combination of Hemkumar, Nguyen, and Takahashi. Applicants respectfully traverse these rejections, because the cited combination fails to disclose or suggest every element of any of these claims, as would be required to establish a *prima facie* case of obviousness under M.P.E.P. § 2143.

Similar to claim 1, independent claim 15 (as amended above) includes at least the element of: an echo return loss based attenuation data generator operatively coupled to the uplink data attenuator and operative to produce the uplink echo return loss based attenuation data in response to echo return loss data wherein the echo return loss data is based on at least one of: attenuated downlink data and at least one of pre-echo canceler uplink data and amplifier gain data, and wherein the attenuated downlink data is provided to the echo return loss based attenuation data generator before the attenuated downlink data is amplified for audio playback.

For at least the same reasons discussed above with respect to independent claim 1 (and other independent claims), Applicants respectfully submit that claim 15 (as well as dependent claims 16-20 that each includes at least all of the limitations of claim 15) is patentably distinct over Hemkumar. Further, Applicants respectfully submit that Nguyen and Takahashi fail to make up for the deficiencies in Hemkumar with respect to the claimed invention, as discussed in detail above.

Applicants do not concede that the remarks made by the Examiner with respect to claims 15-20 are correct. However, Applicants respectfully submit that those points are moot in view of the fact that Hemkumar fails to disclose or suggest the invention as recited in each of claims 15-20.

7. Response to §102 Claim Rejections of Claims 7 and 11-13

The Examiner rejected claims 7 and 11-13 on grounds of obviousness over a combination of Hemkumar and other various cited art (see "Summary of Office Action" section above). Applicants respectfully traverse these rejections.

Each of claims 7 and 11-13 depends from an independent claim 4 or 10 and therefore incorporates all of the elements of claim 4 or 10. As discussed above, Hemkumar fails teach or suggest the invention as recited in any of claims 4 and 10. Therefore, Hemkumar also fails to teach or suggest the invention as recited in any of claims 7 and 11-13.

Further, Applicants respectfully submit that other cited art fail to make up for the deficiencies in Hemkumar with respect to the claimed invention, as discussed in detail above.

Applicants do not concede that the remarks made by the Examiner with respect to claims 7 and 11-13 are correct. However, Applicants respectfully submit that those points are moot in view of the fact that Hemkumar fails to disclose or suggest the invention as recited in each of claims 4 and 10.

8. Conclusion

In view of the foregoing, Applicants submit that claims 1-26 are in condition for allowance. Therefore, Applicants respectfully request favorable reconsideration and allowance of those claims.

Respectfully submitted,

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